

Draft Summary Preliminary Criteria for Aquatic Habitats

(North Sea, South Sea, North Sea Combined, and South Sea Combined Configurations)

Habitat	Attribute	Restoration Criterion/Action	Justification/Uncertainty
Open Water			
	Salinity	>20 ppt Target 35 ppt Range 30-40 ppt	Salinity greater than 20 ppt is intended to prevent growth of emergent vegetation and reduce vectors and avian disease. Target salinity and salinity range is intended to contribute to water quality conditions necessary to support a productive marine fish and invertebrate communities at the Salton Sea.
	Eutrophication	Reduce phosphorus loading in the Salton Sea	Nutrient ratios indicate that algal growth in the Salton Sea is phosphorus limited. Reduction of phosphorus loads in the Salton Sea (through load reduction in the inflow or in the Sea itself) is intended to reduce the level of eutrophication and contribute to a reduction in the frequency and magnitude of events that kill invertebrates and fish in the Salton Sea. Uncertainty remains, however, regarding how the dynamics of the Sea might change with a smaller, less eutrophic Sea and the length of time required before desired benefits would be achieved.
	Surface Area	Not likely a factor	Several avian species such as eared grebes and American white pelican are attracted to large expanses of open water. Under the various configurations under consideration, the area of the Salton Sea likely will remain sufficiently large to attract and meet the behavioral requirements of the birds using these areas.
	Islands and Snags	Maintain or create islands and artificial structures (snags)	Islands in the Salton Sea provide nesting and roosting opportunities for a variety of species. The aerial extent and quality of these islands is influenced by water surface elevation. Proximity to foraging areas and potential human disturbance also influences the value of the islands to birds. Maintaining islands or creating additional islands is intended to retain the values islands provide and reduce limitations on breeding birds using islands at the Sea. Snags and roosting structures also provide valuable roosting and nesting sites for several colonial bird species. Creating artificial structures to support roosting and nesting is intended to retain the value currently provided by existing structures into the future. These features should be placed in areas that enhance their attractiveness to birds and minimize the potential for human disturbance.

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	Depth	Not likely a factor under these four configurations	A range of water depths is important to accommodate the foraging strategies used by various birds (e.g., double-crested cormorants, eared grebes, American white pelicans, and diving ducks) and maintain avian diversity. Under these configurations, maximum depth would not be less than 40 feet. Marine fish and invertebrate populations were supported in the Salton Sea in previous years (early 1960's) when depth ranges were similar, suggesting that this range would also support those or similar species. Uncertainty remains, however, regarding how reduced depth would influence anoxic conditions, water temperature, oxidation-reduction potential, and other water quality concerns through increased mixing and re-suspension of bottom sediments. Uncertainty also remains with regard to the depth necessary to support a marine fishery and the ability of the deepest portions of the Sea to support aquatic life.
Shallow Water/ Shoreline			
	Area	Create additional shallow water/ shoreline habitat	The extent of the shallow water habitat associated with the shoreline of the Salton Sea would be influenced by water availability and the location of the residual Salton Sea. Under future projections, the size of the Sea and its shoreline will decline, resulting in a reduction of shallow water habitat relative to present conditions. The reduction in habitat values provided by shallow water along the shoreline of the Salton Sea under some configurations could be offset and enhanced by creation of new managed saline shallow water habitats.
	Pupfish Habitat and Habitat Connectivity	Maintain stable aquatic habitat that provides connectivity among the pupfish populations supported in drains discharging directly to the Salton Sea. Design to minimize potential for predation.	Under current conditions, pupfish supported in agricultural drains can use the Salton Sea to move among drains. Maintaining a stable aquatic connection is intended to support connectivity among populations and avoid the potential complications associated with isolation.

Habitat	Attribute	Restoration Criterion/Action	Justification/Uncertainty
Shallow Water Habitat			
Freshwater Marsh (managed)			
	Water Quality	Selenium \leq 2 ppb	Criterion for selenium concentration in source water for managed marshes is intended to minimize the potential for ecological risk.
	Depth	Variable depths (generally <3 feet)	Optimal depth depends on species requirements. At a project level, freshwater marsh likely would be managed for a variety of species and vegetation configurations.
	Size	Maximum of 10,000 acres	Initial acreage for freshwater established at 10,000 acres. Freshwater inflows can be used to create up to 10,000 acres of freshwater marsh or used to extend the acreage of saline shallow water habitat through dilution. Allocation of a portion of the freshwater flow for these purposes retains flexibility to shift the relative proportion of saline and freshwater habitat in response to future changes.
	Arrangement	To the extent possible, position near refuges, agriculture, or current areas of high wildlife use	The value of habitat is influenced by activities that cause disturbance to wildlife species as well as proximity to other habitats. Placement of created shallow water habitats in areas not likely to be influenced by human activity and in close proximity to other existing habitats is intended to improve the value of those created habitats to wildlife.
Shallow Saline Habitat (managed)			
	Salinity	Range of salinities from 20 ppt to 200 ppt	A range of salinity is intended to increase the diversity of the invertebrate population and foraging opportunities for birds, especially shorebirds. It also provides the opportunity to take full advantage of available water for habitat purposes. Because of evaporation, the salinity of the saline shallow water habitat would increase progressively, with different associated invertebrate populations. Corixid (water boatman) and chironomid (midges) would be the dominate invertebrates at salinities between 20,000-60,000 ppt, brine flies would be produced at salinities between 30,000 and 100,000 ppt and brine shrimp would be present at salinities between 60,000 and 200,000.
	Depth	Variable depths (generally <3 feet)	The optimum forage depth varies by bird species. Providing variable depths is intended to provide foraging opportunities for the full range of species that rely on this habitat. Deeper areas also provide refugia for invertebrate species.
	Vegetation	None	At salinities greater than 20 ppt, vegetation would not become established.

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	Size	Maximize based on available flow	The amount of created saline shallow water habitat would be dependent on the availability of flow. Maximizing habitat values with available water would contribute to achieving habitat goals.
	Arrangement	To the extent possible, position near refuges, agriculture, or current areas of high wildlife use	The value of habitat is influenced by activities that cause disturbance to wildlife species as well as proximity to other habitats. Placement of created shallow water habitats in areas not likely to be influenced by human activity and in close proximity to other existing habitats is intended to improve the value of those created habitats to wildlife.